

Social LCA Researcher School Book

*Social evaluation
of the life cycle,
application to the
agriculture and
agri-food sectors*

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15 Mobilizing stakeholders to anticipate impacts

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To sum up

From the literature review performed by Mathé (2014), we explain the objectives of implementing participatory methods in the framework of social LCA studies. We focus on the "Principles, Impacts, Indicators" method, and briefly present three case studies.

Outlook

Introduction

1. The objectives of participatory approaches in LCA
 2. Principles, Impacts, indicators (PII): a five-steps participatory approach
 3. Case studies
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- Conclusions

Introduction

From the literature review performed by Mathé (2014) emerged different fields of theoretical research concerning the nature and the integration of stakeholders in social LCA.

First, involving stakeholders meets the necessity of addressing sustainability issues, which are complex and context-related. Moreover, complexity has to be considered also in the context of firm paradigm evolution. In recent years, the firm has extended its boundaries, and consequently, has extended the range of actors to be considered.

Another sphere of interest is the stakeholder engagement to balance the incomplete information and incomplete knowledge provided by research.

Evolution of the evaluation paradigm

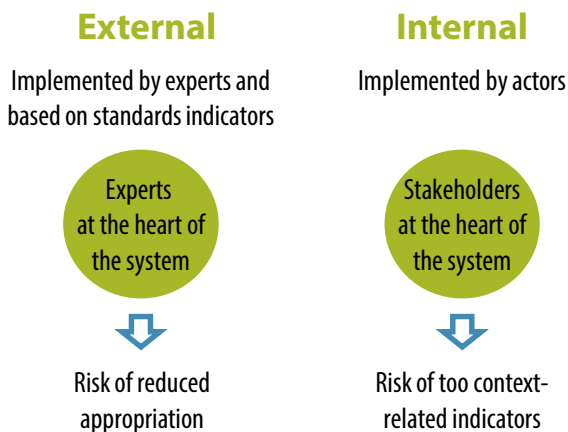


Figure 1: Comparison of external and internal evaluation

In addition, there is also an evolution of the **evaluation paradigm**. At first, the assessment was implemented by experts and based on standards indicators (**external evaluation**). In more recent years, **internal evaluation** has been promoted to encourage the involvement of affected stakeholders. The figure 1 highlights the main differences between both kinds of evaluation.

1. The objectives of participatory approaches in LCA

Usually, the objective of implementing participatory approaches is to **develop democratic practices**:

- by promoting expression and communication by interest groups,
- by considering all the interests,
- by building consensus to facilitate the implementation of sustainable development (Dalal Clayton and Bass 2002).

The quality of the participatory arrangements and the quality of the organization determine the quality of the results (Rowe and Frewer 2000). The quality of the participatory arrangements influences the credibility of the procedures, through the representativeness and the transparency of the process, and through independence of the participants.

Here, the quality of the organization is understood as:

- free access to resources for stakeholders,
- clear definition of roles,
- adequate structure and clarity of the decision-making process,
- cost effectiveness.

Moreover, the **choice of stakeholders** is crucial, especially in order to avoid technocratic participation (Rosenström and Kyllönen 2007).

In Life Cycle Thinking (LCT) stakeholders can be sorted into four groups, as depicted in the figure 2:

- 1) LCA method users,
- 2) LCA result users,
- 3) victims or beneficiaries of impacts,
- 4) actors in the definition of either the types of relevant impacts or – more generally – of the LCA methodology.

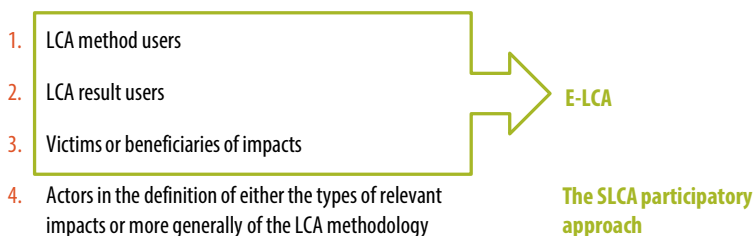


Figure 2: Different groups of stakeholders in Life Cycle Thinking

The first three groups are typical of Environmental-Life Cycle Assessment (E-LCA), while the group 4 of stakeholders is the **core target of the social LCA participatory approach**. More accurately, it requires the stakeholders' participation in the evaluation scheme development (definition of principles, of the nature of impacts to be assessed and of the indicators). This involvement has multiple functions.

2. Principles, impacts, indicators (PII): a five-steps participatory approach

In this chapter, we present the participatory approach implemented in our researches. The figure 3 sums up the five-step participatory approach used to select social

principles, impacts, and indicators, in order to contribute to social LCA development. We start from one process we want to study.

Step 1: it is the step of the selection of stakeholders, presenting the three following features:

- they have an impact on the process or they are impacted by the process (it is close to current LCA approaches, insofar as the stakeholders affected by the production process are considered);
- they have legitimacy to be involved in the process (that implies the search of representatives of interest groups);
- when stakeholders are all together, the range of opinions is complete (that integrates the diversity of social representations in order to incorporate different interests and values).

Step 2: it is the step for collecting data and reviewing the literature on social aspects. Data collection is based on interviews with stakeholders about their representations of the social aspects of the activity concerned. The data are analysed to reveal the social principles and impacts which are the most significant for stakeholders. The method is original as it integrates a bottom-up approach through the interviews, with a top-down approach that complements the interviews results, thanks to significant principles emerging from international conventions and literature on well-being.

Step 3: in the third step, the bottom-up and the top-down approaches are consolidated by a working group gathering social LCA practitioners from different disciplines (socioeconomics, agronomy, ecology) which enabled an "exhaustive" list of social principles and impacts to be developed. The literature review and the consolidation are also undertaken at indicator level.

Step 4: during the fourth step, the list of social principles and impacts is discussed within stakeholder focus groups, so that it could be adapted to the studied context.

Step 5: the fifth step comprises two parts:

- a literature review of social indicators and databases provides a list of existing and available data;
- the literature review allows the researchers to choose indicators according to selected impacts.

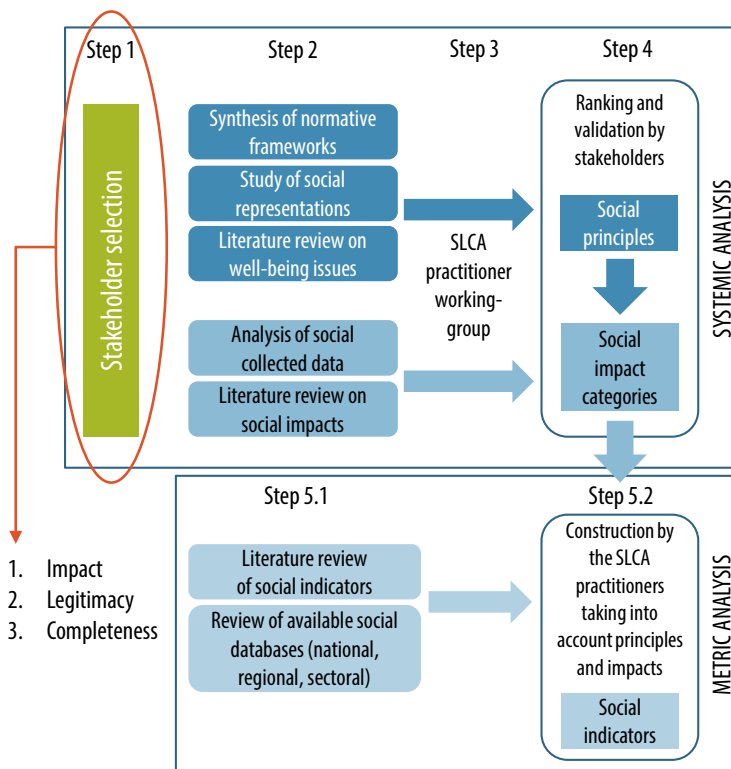


Figure 3: Sum up of the PII method for stakeholders participation

3. Case studies

Here we are presenting the results of three case studies, which (more or less) apply the PII method within social LCA studies.

3.1 Palm oil biodiesel in Jambi Province of Indonesia

The case study implemented by Manik et al. (2013) aims to investigate the social implications of the existence of the value chain of palm oil biodiesel, via a case study using a life cycle assessment framework, in Jambi Province of Indonesia.

In the inventory phase, Manik et al. (2013) made a survey among experts and decision makers to define the relevant social sustainability criteria. Experts and stakeholders were involved also in weighting and gauging phases. The whole design of the method is depicted in figure 4.

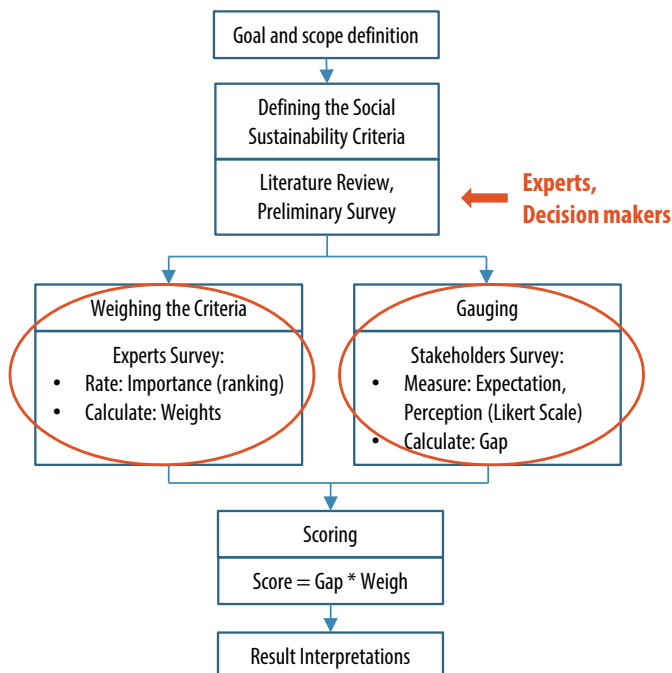


Figure 4: Design of the method for the case study "Palm oil biodiesel in Jambi Province of Indonesia" (source: Manik et al., 2013)

3.2 Clementine farming in Southern Italy

This research addresses the issue of the impacts of migrant workers' presence in the South of Italy (they are mainly involved in citrus fruits value chains).

The present study outlines a methodology that combines social LCA with two research tools. The first is the focus group, adopted from qualitative research. The second is the Analytic Hierarchy Process (AHP), adopted from operational research, which belongs to the framework of Multicriteria Decision Analysis (MCDA). These have been used to make the social LCA more locally relevant and to legitimate the chosen criteria. The table 1 sums up the structure of the categories of impacts, and some other data.

Three different methods were adopted:

- 1) focus groups with local experts to define categories, impacts and indicators;
- 2) data gathering through interviewed and semi-structured questionnaires;
- 3) AHP (Analytic Hierarchy Process) by interviewing a sample of the three stakeholders groups, in order to weigh each category.

Stake holders	Categories	Criteria	Indicators	Sources and data significance	Unit of Measurement
Workers	Equal opportunities	Discrimination between Italians and foreigners	Retribution inequality	Our elaboration on primary source	Quant: % retribution imbalance
		Discrimination between men and women	Retribution inequality	Our elaboration on primary source	Quant: % retribution imbalance
Local community	Use of immaterial resources and technologies	Use of information technologies	Percentage of farms using information technologies	Our elaboration on primary source	Quant: (% farms)
		Use of internet access	Percentage of farms with internet access	Our elaboration on primary source	Quant: (% farms)
		Use of local competences	Percentage of farms using local knowledge: customised tools, machines, softwares	Our elaboration on primary source	Quant: (% farms)
	Area reputation	Reputation of local area linked to the quality of products	Percentage of farms producing Clementine PGI of Calabria	Our elaboration on primary source	Quant: % (ha clem PGI/tot ha clem)
Society	Impact to economic development	Estimated Employment Impact	Estimated Permanent work	Our elaboration on primary source	Quant: n./ha
			Estimated Temporary work	Our elaboration on primary source	Quant: n./ha
			Estimated Stability work index	Our elaboration on primary source	Quant: non-dimensional
		Estimated evasion of contribution payments	Working needs imbalance	Our elaboration on primary source	Quant: days/ha

Table 1: Groups of stakeholders, impacts categories, criteria and indicators in the Clementine farming case in South Italy (source: De Luca et al. 2015)

3.3 Sugar industry in South Africa

The case study implemented by Nemarumane and Mbohwa (2015) aims to assess social and socio-economic impacts of the existence of the South African sugar industry.

In this study, the authors simply used questionnaires to gather data, as depicted in the table 2 below.

Characterization	Growers and millers	Technique used to gather data
Health and safety	<ul style="list-style-type: none"> Exposure to physical hazards Protective equipment available 	Questionnaire, interview and field research
Wages	<ul style="list-style-type: none"> Satisfaction of wages and commission Availability of wage-related incentives Basic expenditure of wages 	Questionnaire, historical comparative data, interview
Gender equality	<ul style="list-style-type: none"> The ratio of men to women in the workplace Treatment of men to women in the workplace Favoritism in company policies based on gender 	Questionnaire
Social LCA methodology	Applications and approach	Historical comparative data

Table 2: Nature of impacts, criteria and techniques used to gather data in the sugar industry case in South Africa (source: Nemarumane and Mbohwa, 2015)

4. Advantages, limits and perspectives of participatory approach in social LCA

Here are the main advantages of involving all the stakeholders in participatory approach in social LCA:

- It increases the legitimacy of the assessment, which becomes more adherent to reality (lofrida et al. 2014; Mathé 2014).
- It adapts indicators to the context, far more than when they are developed by experts (Mendoza and Prabhu 2000).
- It guarantees a final set of indicators of better quality (Rosenström and Kyllönen 2007) and which reflect stakeholders' values (Mendoza and Prabhu 2000).
- It improves democratic representation and promotes empowerment and learning opportunities for communities (Fraser et al. 2006) while encouraging partnerships (Mendoza and Prabhu 2000).

- It incorporates preference of different interest groups or stakeholders (De Luca et al. 2015).
- It promotes social learning processes and mutual feedback (Sala et al. 2013).
- It creates new knowledge and legitimates research activities (De Luca et al. 2015).
- Finally, it adapts the lists of normative categories through the collective ranking of them.

Limits of participatory approach in social LCA

- Participatory approach is time and resources consuming.
- Using the participatory approach, we obtain a context-related study, which raises comparability problems. Indeed, it is likely not possible to compare two surveys gained from different locations. Nevertheless, one solution may be the adaptation of the PII. The principles must be sufficiently generic to allow comparisons to be made at their level.
- There is the possibility that relevant categories are not mentioned by stakeholders, and consequently, not considered in the study.
- The personal interviewee experience/perception of impacts affects the study outputs.

Conclusions

As a conclusion, using participation for selecting indicators raises different issues. Indeed, what to do when some changes are deemed socially favourable by one category of stakeholder, and unfavourable by another? How to deal with impacts which are deemed favourable at one given scale, and not at another scale? More generally, how to deal with changes which entail a positive impact in one domain (e.g. children health) and unfavourable impacts in another domain?

Whatever future works, introducing participatory methods in social LCA is still a challenge. It claims for new methods in collective decision making.

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Matrix of the researcher school's contents

